ELECTRONIC BANKING

SAFETY AND SOUNDNESS EXAMINATION PROCEDURES

Federal Deposit Insurance Corporation
Division of Supervision

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I. INTRODUCTION

Electronic commerce is a broad term applied to activities involving the exchange of goods or services for value over a computer network or automated system. As significant participants in the marketplace, financial institutions are becoming more aggressive in adopting electronic banking capabilities that include sophisticated marketing systems, stored value programs, and remote banking capabilities. This area is highly dynamic as emerging technologies yield a variety of delivery alternatives and innovative products and services. Electronic systems are becoming increasingly important due to:

- The increasing competition from non-bank financial services companies, the telecommunications industry, and systems or software developers;
- The demand for more efficient and convenient capabilities; and
- The widening cost and delivery differentials between electronic capabilities and traditional delivery channels.

The opportunities presented can pose significant risks to an insured financial institution. However, these risks can be mitigated by adopting a comprehensive risk management program that begins with a sound strategic plan. Risk identification and analysis should lead the board to adopt appropriate oversight and review guidelines, operating policies and procedures, audit requirements, and contingency plans.

The extent of a financial institution's risk management program should be commensurate with the complexity and sophistication of the activities in which it engages. For example, banks which offer a simple "information-only" site on the World Wide Web generally would not be expected to have undertaken the same level of planning and risk management as institutions that engage in more complex activities.

Note to users: This presentation introduces the concepts of electronic banking and the related safety and soundness issues. Users are encouraged to review the most recent FFIEC Information Systems Examination Handbook for discussion of related technical issues.

The Networked Environment

A computer network is simply an arrangement in which multiple computers are connected so that information, applications, and equipment can be shared. By design, networks can increase efficiency, convenience, and access; however, the design also limits the degree to which the environment can be controlled.

Network access can be through a combination of devices such as card devices with imbedded computer chips, personal computers (PCs), telephones, and interactive television equipment. The connections are completed principally through telephone lines, cable systems, and in some instances, wireless technology.

Electronic banking relies on a networked environment. Whether the system is informational or transactional, these systems facilitate interaction between the institution and the user (generally, a customer), often with the support of third-party service providers. Phone banking, stored value programs, and PC banking services are important examples of electronic banking networks. Increasingly, financial institutions are also focusing on the opportunities presented by the Internet and World Wide Web.

The Internet is a public "network of networks" that can be accessed by any computer equipped with a modem. While not centrally managed, the Internet is given order through the World Wide Web which facilitates visual interfaces and links (i.e., electronic connections), to other information. The "Web" also provides the multimedia capabilities such as text, graphics, audio, and video. Intranets are private networks that are built on the infrastructure and standards of the Internet and Web. Intranets allow access to databases and electronic documents by a defined user group that might include employees, customers, and vendors.

II. ELECTRONIC CAPABILITIES

Financial institutions have provided electronic capabilities for a number of years. Familiar examples include basic phone banking, automated teller networks, and automated clearinghouse systems. However, technological advances have brought greater sophistication to all users, commercial and retail alike.

For instance, sophisticated phone systems and direct dial-up or Internet computer programs facilitate added access. Traditional products and services can be offered through new delivery channels and entirely new products and services may be developed. For example, aside from promotional, lending, and deposit-gathering activities, banks can support bill payment programs, non-deposit sales activities, and cash management services. Electronic capabilities may also yield new electronic payment options such as digital cash.

Although an over-simplification, electronic capabilities can be segregated into three categories by degree of functionality. Systems can simply provide information as defined by the publisher ("information-only systems"), they can allow users to share information and communicate ("electronic information transfer systems"), or they can facilitate electronic funds transfer and other financial transactions ("electronic payment systems"). Many systems will involve a combination of these capabilities.

Information-only Systems

For examination purposes, information-only systems are defined as those which allow access only to general purpose, marketing, or other publicly available information. In these systems, the "publisher" (generally, the bank) defines the information to be made available. In this sense, the publisher is simply communicating electronically what has traditionally been made available in print and through other media. The electronic format provides a more cost efficient channel that

offers greater flexibility in terms of audience, content, and geography.

Sites established on the World Wide Web often represent the most prominent form of electronic information-only systems. Although these sites are generally marketing oriented, each can contain as little or as much information as the publisher desires, and can be linked to other sites that provide additional information.

Web sites can also enhance marketing efforts by collecting information about each visitor to a site. This can include user identity, access devices or servers used, and the specific products and services reviewed. As technology advances, the type and amount of data collected might be used to target frequent visitors with specific products, services, and information for which the user has shown a previous interest. Beyond the proprietary benefits derived from data collection, the aggregated files become valuable assets that may be marketed to business users.

Electronic Information Transfer Systems

Electronic transfer systems are interactive in that they provide the ability to transmit messages, documents, or files among a group of users. This category includes electronic mail capability that allows for messages or information to be sent from one user to another. It also includes systems in which data or files may be uploaded and downloaded between users and proprietary databases or networks. A bank Web site that allows a customer to submit an online loan or deposit account application is an example of an electronic information transfer system. In the future, more sophisticated systems may provide a format by which parties to a transaction can enter into legally enforceable contracts.

Communication security is a vital component of information transfer in a networked environment. Privacy, data integrity, and user legitimacy are essential to realize the full benefit from information transfer systems. These can be achieved through a comprehensive system of encryption, authentication, and certification.

Electronic Payment Systems

Electronic payment systems resemble traditional systems because both are derived from a common monetary model. In this sense, electronic systems are simply alternative means to deliver traditional banking and related products and services. Both must complete the same general steps within the payment cycle to reach finality: payment entry, settlement, and distribution. In all cases, trust in the participants (i.e., banks and non-banks that issue, process, and settle payments) and confidence in the process are crucial to a particular system's acceptance and survival. These factors have historically maintained the banking industry's central position within the payment system.

Beyond trust and confidence, users evaluate payment systems on a number of criteria, including:

- User privacy;
- Transaction legitimacy, security, and non-repudiation;
- System dependability, efficiency, and cost; and
- Merchant acceptance and convenience.

Electronic payment systems can be broadly categorized according to system components, process methodology, and system structure. The combination of attributes will determine, to a large degree, the amount of risk inherent in a particular system. However, risk will also vary significantly depending on system implementation, administration, and the controls employed by each participant. The following table details various electronic payment system characteristics.

CHARACTERISTICS OF ELECTRONIC PAYMENT SYSTEMS	
System Components:	**Chip versus magnetic strip technology** **Card versus computer-based systems** **System hardware (i.e., PC, card reader, ATM , etc.)**
Process Methodology:	**Batch versus real-time processing** **Online versus offline access**
System Structure:	**Legal currency versus branded (proprietary) value** **Single versus multiple currency** **Debit- versus credit-based systems** **Open versus closed systems *** **Reloadable versus single use systems** **Controlled versus secured access** **Single versus multiple purpose** **Integrated versus stand alone systems** **User anonymity** **Payment mechanics (buyer and seller interaction)** **Payment system settlement (processing)** **Transaction size (micro or large-dollar payments)** **Geographic reach**

*** With respect to payment systems, open systems are characterized by broad geographic presence and acceptance by a large number of merchants or programs. Closed systems generally involve a smaller geographic presence and/or a single or limited purpose use.**

Note: The table is intended to show the primary decision areas in developing a payment system. Software is not specifically included because it is what converts the decisions regarding components, methodology, and structure into an operative system. Indirectly, software decisions are imbedded throughout the table.

Note: The subcategorizations do not necessarily present "either... or..." decisions. In many ways, the decisions run along a continuum, such as the degree of security or system integration. Technology also allows for systems to be accessed via multiple access media, such as electronic kiosks, PC dial-up programs and Internet services.

Bank Roles in Electronic Payment Systems

Participants in an electronic payment system may include users, financial institutions, third party processors, and government-backed central banks. Although electronic capabilities have changed the framework of payment systems, financial institutions will continue to participate in a variety of roles. While financial institutions are familiar with many of the roles, the dynamic environment presents a new set of challenges and risks in nearly every case. Banks may perform any one of the roles described below or a combination of multiple roles.

- **Owner or Investor** - Banks might acquire equity or similar stakes in payment systems, which can take the form of an equity investment, partnership or joint venture arrangement, or consortium member. As such, the bank may bear financial, strategic, compliance, and reputation risks depending on the ownership structure and the venture's success or failure.

- **System Developer -** System development might be undertaken as an in-house effort or under agreements with other parties. In either case, development efforts introduce financial, systemic, reputation, and strategic risks. Potential liability can be well beyond the amount funded, contracted, or, in the case of stored value programs, the amounts held.

- **Issuer** - Issuers sell stored value to participants, either directly or indirectly through another entity. Issuers bear transaction and liquidity risks associated with funding the recorded obligations. Issuers also bear strategic, compliance, and reputation risks, and are potentially liable in the event value is counterfeited or compromised.

- **Distributor/Redeemer -** These roles support stored value systems by distributing or redeeming value. The responsibilities can be taken on individually or can be combined in a dual capacity. In the case of distributing banks, the risks include transaction, compliance, reputation, credit, and liquidity risks. Redeeming banks are exposed to transaction and credit risks.

- **Transaction Authorizer and Processor -** This role is similar to credit card arrangements whereby transactions are authorized through the payment system prior to completion. Responsibilities can include authorizing, remitting, clearing, and settling transactions. Risk areas, which can include credit and liquidity, may be mitigated by adequate operating procedures throughout the transaction process.

- **Recordkeeper/Transaction Archiver** - Although appearing to be largely administrative, these roles maintain audit trails and provide the means to settle disputes among participants. Ineffective operations may result in heightened transaction, reputation, and compliance risks.

- **Trusted Third Party** - In the role of a trusted third party, a financial institution may serve as a certifier for electronic transactions. In this capacity, the bank certifies the identity of

one or more parties to an electronic transaction who seek to authenticate each other. Errors or omissions could result in significant liability.

- **Other -** Because many systems are credit or debit based, banks may also serve in traditional roles. These might include providing data processing services much like traditional credit and debit card programs, or serving as a depository and administering funds under the direction of the end user or system provider.

Note: The scope of the safety and soundness electronic banking examination procedures focuses primarily on retail electronic payment systems. Large dollar and wholesale payment systems are addressed in more detail in the FFIEC Information Systems Examination Handbook.

III. RISKS

Regardless of the level of sophistication, risks are inherent in all electronic capabilities. For instance, an information-only Web site used for advertising purposes may be inappropriately altered by unauthorized parties. Electronic mail containing confidential or proprietary information may be distributed in error. Networked systems that are directly connected to a bank's central operating system or main database might be accessed by unauthorized parties, revealing sensitive data or applications. System failures have also occurred due to power outages and system defects.

Electronic delivery and payment systems involve a wide range of potential risk exposures. The use of an electronic channel to deliver products and services introduces unique risks due to the increased speed at which systems operate and the broad access in terms of geography, user group, applications, databases, and peripheral systems. In addition to the unique risks, traditional risks which are similar to those in customary banking activities are also present. For example, if a bank conducts lending or deposit gathering activities over an electronic channel, credit and liquidity risks must be considered in the context of the high-speed, wide-access electronic environment.

Specific Risks to Electronic Systems

Unique risks posed by electronic delivery channels are reflected in each of the six areas of concern identified in the following table. While not all-inclusive, the specific risks allude to the rapid transaction speed and broad access associated with electronic delivery channels. Reliance on third party vendors for technology and uncertainties in the legal and regulatory environment also introduce unique risks to electronic delivery and payment systems.

SUMMARY OF SPECIFIC RISKS Electronic Delivery and Payment Systems	
Area of Concern*	**Specific Risks and Concerns**
Planning and Deployment	▸ **Inadequate decision processes while considering, planning, and implementing electronic capabilities** ▸ **Impact of technology cost and pricing decisions on financial position** ▸ **Strategic implications of interstate and global activities** ▸ **System design and capabilities may not meet customer demands** ▸ **Implications of increasing competition from/involvement with non-financial entities** ▸ **Uncertain applicability of blanket bond/other insurance coverages to electronic activities**
Operating Policies and Procedures	▸ **Managerial or technical incompetence relative to electronic activities** ▸ **Existing controls may not adequately protect confidential electronic information** ▸ **Existing policies and procedures may not address the transaction speed and broad reach of electronic channels**
Audit	▸ **Audit trails may be lacking in electronic systems**
Legal and Regulatory	▸ **Uncertain enforceability of digital contracts, agreements, and signatures** ▸ **User privacy issues** ▸ **Contingent liabilities may result from user or participant claims** ▸ **Uncertain legal jurisdiction with respect to taxation, criminal, and civil laws** ▸ **Implications for interstate and international commerce** ▸ **Uncertain regulatory environment (local, national, and international; financial services and other areas)** ▸ **Uncertain applicability of reserve requirements to electronic money** ▸ **Uncertain applicability of financial recordkeeping, disclosure, and other requirements** ▸ **Uncertain acceptability of electronic documentation/disclosures under various regulations**
Administration and System Operations	▸ **Hardware and/or software failures or disruptions** ▸ **System and/or data base compromise** ▸ **Inadequate system capacity** ▸ **System obsolescence** ▸ **Administration of multiple standards and protocols** ▸ **Inadequate protection of electronic communications** ▸ **Inadequate system security and controls**
Vendors and Outsourcing	▸ **Reliance on vendor competence to perform critical functions** ▸ **Internal controls may not extend to third party vendors** ▸ **Weak system support among vendor group** ▸ **Maintenance and administration of multiple inter-related systems, activities** ▸ **Failure to monitor inter-relationships among multiple financial institutions, vendors or originators, and participants within a payment system**
*** These Areas of Concern are generally consistent with the six Review Areas of the Safety and Soundness Electronic Banking Examination Procedures.**	

The table identifies numerous risks; however, the threat of failure or compromise in any system is

significantly more pronounced in an environment of interconnected computer systems. As such, it is deserving of particular attention. Potential causes of a system compromise include natural disasters, participant failure, or system attacks which are described more fully below:

- **Natural disasters** - The risks presented by natural disasters grow as the geographic reach of a network expands. For instance, the server equipment for a particular system might be distantly located, requiring public telecommunications networks for access. An interruption at any point along the connection might impact service.

- **Participant failure** - The failure of one or more participants in a payment system can have a significant financial impact on all participants. For instance, membership contracts may require that all participants share in the financial loss from an individual failure. In a worst-case scenario, a significant individual failure might cause other participants, and the entire system, to fail. Because trust and confidence are critical, public reaction to a minor failure could jeopardize an entire system.

- **System attacks** - Internal or external attacks may be undertaken to deny service to others, access databases, manipulate applications, or alter financial outcomes. Beyond financial gain, motives can range from simply trying to overcome system security ("the challenge") to commercial espionage. Many perpetrators attempt to hide evidence of the attack, making it more difficult to identify the source or methods employed.

The effects of a system failure or compromise can rapidly extend beyond the interested parties. Further, the reputational harm and lost confidence could seriously jeopardize the viability of the underlying system. Comprehensive risk management programs are critical to identifying and responding to any incident.

IV. RISK MANAGEMENT

Traditional risk management programs will need to be adapted to address new aspects of an electronic environment which may include transaction speed, geographic reach, and user anonymity. Such aspects introduce new challenges for management systems designed to monitor activities or trends. For example, questionable activities conducted electronically might not be discovered by traditional review and audit processes. This could limit or distort the quality of information upon which management relies to make effective decisions.

Risk management is the ongoing process of identifying, measuring, monitoring, and managing potential risk exposure. With respect to electronic delivery and payment systems, the process should encompass all significant economic, legal, regulatory, and technological risk areas. Depending on the level of activity, consideration may be given to:

- General supervision, as evidenced by: planning and analysis, policies and procedures, accountability and authority, regulatory compliance and legal framework, human

resources, and audit;
- Transaction processing, as seen in: user legitimacy, information integrity, non-repudiation of transactions, and data confidentiality; and
- Systems administration, as evidenced by: resource requirements, system security, system reliability and contingency planning, system capacity, outsourcing policies, and systems update control.

The results of the risk management process should generally be integrated into:

- Strategic planning and feasibility analysis;
- Management supervision and internal controls;
- Operating policies and procedures;
- System administration, audit and testing;
- Physical, transaction, and system security;
- Vendor due diligence, and vendor/internal support teams;
- Incident response and preparedness plans;
- Disaster recovery, business resumption, and contingency plans; and
- Ongoing review of technological developments and capability enhancements.

The above list is generally comprised of traditional risk management techniques that may be applied to electronic delivery and payment systems. However, risk management techniques which have specific relevance for electronic banking are worthy of further discussion. These include strategic planning and feasibility analysis, incident response and preparedness, and internal controls.

Strategic Planning and Feasibility Analysis

As noted above, strategic planning and feasibility analysis should be included in any risk management effort. However, their importance cannot be overstated in moving toward an electronic environment due to the significant investment, opportunities, and risks involved in deploying electronic capabilities. Strategic planning is an ongoing process from which an organization's mission and objectives are developed. Although the processes are similar, the focus of strategic planning is on the organization while feasibility analysis concentrates on specific proposals.

Feasibility analysis is the process of determining the likelihood that a proposal will fulfill specified objectives. The analysis should begin at the point an opportunity is identified, and continue through deployment. Specifically, each opportunity should be analyzed in three stages: (1) Study, during which needs and objectives are analyzed, and alternatives are developed based on performance specifications; (2) Design and Development, during which the best solution is identified based on technical specifications, the system is installed, policies and procedures are developed, and documentation is completed; and (3) Operation, during which the system is operated and maintained.

Once deployed, each system must be subject to ongoing reviews to evaluate performance against current strategic plans and objectives, operating requirements, and technological developments. Any deficiencies should be documented for appropriate action.

Incident Response and Preparedness

A primary focus of risk management is to minimize the negative effects of a problem situation. This can be particularly difficult in an electronic environment that offers speed, sophistication, and access to many users, regardless of their legitimacy. Further, because systems will likely impact all activities to one degree or another, a single problem can have an impact on several areas including product management, marketing and customer service, and operations.

For instance, electronic advertising can provide information about products, services, rates, and fees. Incorrect information can possibly lead to customer complaints, contingent liabilities, or lost opportunities and income. As a result of a system attack, content may be altered to include inappropriate or even obscene material that can be viewed by the general public. Because of weak controls and security, users may be able to access, disclose, or improperly use confidential information.

Although the degree of sophistication will vary depending on the risks inherent in each system deployed, establishing an incident response team or preparedness plan provides a platform from which an institution can respond to a problem situation. Just as in contingency planning, the objective is to identify and prepare officers and employees who represent key departments and functions, and who collectively provide the expertise necessary to respond quickly and decisively. The composition of a response team or extent of a preparedness plan will depend upon the level and complexity of electronic banking activity and the institution's available resources.

In assembling a response team or developing a preparedness plan, decisions should be guided by management's judgement. The beginning point is to assess the risks posed by each system deployed to identify the principal departments, resources, activities, and constituencies potentially impacted by a problem. Individual(s) should then be formally appointed and empowered with the latitude and authority to respond during an incident.

Internal Routines and Controls

Any component of a computer system can be compromised by a number of threats, natural and otherwise. Because threats expand as access to a network expands, the system becomes more vulnerable. However, this vulnerability can be reduced by employing a range of controls that, in combination, protect the operating system and data.

An effective security program does not rely on one solution, but on several measures that, together, serve to identify, monitor, control, and prevent potential risks. The most effective

control programs will customize hardware, software, and manual controls during the system development phase.

System controls are an integral part of any risk management program. The extent of such a program should be commensurate with the level and complexity of the activity. Through comprehensive system reviews and tests, controls should be incorporated to protect hardware and software, proprietary data, and electronic transmissions. To ensure maximum effectiveness, management must also recognize the importance of educating all users on the need to adhere to the control standards. This educational effort should also address the risks of not adhering to the standards.

Although not all-inclusive, the table below presents potential risks and mitigating controls that should be considered in developing a system security program.

Potential Risk	Mitigating Controls
Unauthorized Intruder Accessing Information **System security compromised as a result of a hacker accessing the system, intercepting data during transmission, or wire tapping.**	**Access Control** **Implement physical and system access controls, including on-site security, system passwords, firewalls, encryption, and intruder detection mechanisms.**
Loss of Data Integrity **Accuracy and reliability of data compromised as a result of unauthorized fabrication, poor audit trails, absent physical signatures, errors introduced into the system, or corruption.**	**Authentication** **Utilize authentication controls to preserve the integrity of the data. Such controls include acknowledgment, computerized logs, digital signatures, edit checks, and separation of duties.**
Lack of Transaction Completeness and Inability to Transmit Transactions **Loss of transactions during transmission, duplication of transactions due to retransmission, or inability to transmit transactions.**	**Acknowledgment** **Require acknowledgment controls (batch totaling, sequential numbering, one-for-one checking against the control file), adherence to protocols, anti-virus software, offsite backup, and contingency planning.**

Other Considerations

Although consumer protection and trust activities are addressed through separate examination programs, weaknesses in either area can have a significant impact on a bank's overall condition. As such, it is important that plans to deploy electronic systems consider the full range of implications. To do otherwise may impact the institution's compliance posture, and possibly result in consumer complaints or contingent liabilities through civil actions.

V. EXAMINATION PROGRAM

General

The electronic environment continues to evolve in terms of the technology employed and activities conducted. The rapid pace of change in the networked environment calls for a risk

management approach to examinations. Therefore, examiners will evaluate an institution's overall effectiveness in controlling the broad risks inherent in electronic delivery systems.

In many cases, financial institutions will deploy multiple systems to provide customers with a range of options. Examiners should complete the safety and soundness electronic banking examination procedures for each system deployed. In this regard, examiners should make a determination as to what level is appropriate for each system. While systems will generally be reviewed individually, consideration should be given to the degree of integration. Examiners should use judgement in identifying common review points, such as operating policies and strategic plans.

The safety and soundness electronic banking examination procedures are intended to compliment traditional examination procedures in the evaluation of specific activities, such as lending, deposit-gathering, and non-deposit activities. Therefore, efforts should be made to coordinate reviews of written policies, internal controls, and other related functions.

Pre-examination Planning

Pre-examination planning should identify electronic banking activities. For example, information requests should be included in entry letters or addressed during the initial meeting with bank management. Examiners should review any Electronic Banking Data Entry Sheets on file and the bank's Web site, if any, to determine the extent and complexity of electronic banking activities.

Examination Levels

Three levels of examination review have been established to recognize the range of risks in electronic systems. The levels are designed to build on one another, such that examiners will complete level 1 procedures for all system reviews. In the case of very simple systems such as those that only provide information to users, the examiner will complete only level 1 procedures. In the case of more advanced systems which permit transfer of information or data, examiners will complete level 1 **and** level 2 procedures. For systems that involve transactional capabilities, **all three levels** will be completed. In those instances in which it is difficult to discern what level should be completed, examiners should consult with information systems specialists. However, as a general rule, examiners should use the higher level procedures in cases of uncertainty.

- **Level 1** - In the review of very simple systems, only level 1 procedures will be completed. Examples of such "less sophisticated" systems include information-only Web sites that are limited to presenting electronic versions of marketing or informational brochures, and advertising of products, services, rates, and fees. Since level 1 procedures will also be completed for more complex systems, they are designed to be interpreted broadly and examiners should use judgement in applying them to systems having different degrees of sophistication.

- **Level 2** - These procedures are intended to expand on level 1. Level 2 procedures should be performed for systems that are capable of accessing and transferring data, files, or messages. This might be through electronic mail or systems that provide uploading and downloading capabilities, regardless of the nature of the data, files, or messages. Information-only systems that provide access to confidential data will be subject to a level 2 review due to the sensitive nature of the information conveyed.

- **Level 3** - These procedures are intended to expand on levels 1 and 2. Level 3 procedures should be performed for systems that enable users to direct or process financial transactions (e.g., transactional Web sites and stored value systems).

Note: Because the three levels of procedures are designed to build on each other, there are certain review areas that do not include specific items for each level. For example, a particular review area may include specific items for levels 1 and 2, but no additional items for level 3.

Examination Review Areas

The following six review areas are designed to address electronic banking capabilities. A general description of each review area is provided below. Certain review points may overlap with other assignments (such as lending or non-deposit activities). Examiners should coordinate these efforts among the examination team.

- **Planning and Deployment** - Because electronic banking systems facilitate broader access to confidential or proprietary information systems, it is imperative that management (including the board, senior management, and line officers) is fully informed of the opportunities and risks in system deployment. Deficiencies in planning and deployment significantly increase the risk posed to an institution and significantly decrease the ability to respond in a satisfactory manner.

- **Operating Policies and Procedures** - Electronic capabilities can significantly change the character of a bank's business or enable it to introduce new products, services, and delivery channels. Policies, procedures, and other operating guidelines must keep pace with this new environment, either through updates of existing documents or adopting new standards when appropriate.

- **Audit** - Audit procedures are most effective when designed into each system during the development phase. When coupled with a strong risk management program, a comprehensive, ongoing audit program allows the institution to protect its interests as well as those of its customers and other participants. In developing audit programs, the institution must consider the full scope of each application to protect financial and informational assets, system reliability, and user confidence.
- **Legal and Regulatory Matters** - Deploying electronic capabilities necessitates that an institution review the legal and regulatory framework within which each activity will be

conducted. Determining that each system meets minimum standards for initiating, completing, and enforcing legal documents and financial transactions protects the value and efficiencies in more sophisticated systems. Failing to review the regulatory standards and legal foundations introduces heightened risk of direct financial loss, regulatory action, or contingent liabilities resulting from civil actions. Whether an advertising medium or a transactional facility, all systems must also be reviewed for compliance with consumer protection requirements.

- **Administration** - Whether electronic capabilities are developed in-house or acquired through a service provider, the bank retains the obligation to ensure minimum standards of operation. Therefore, guidelines such as access levels, exception reporting, and record retention must be established and monitored on a regular basis. Failing to do so might result in a system that cannot operate in the manner anticipated. Depending on the scope of activities, users may be placed at risk due to inadequate security measures or unreliable operations.

  An important factor in achieving customer acceptance and confidence involves providing education and support to participants and responding to problem situations. Failing to provide reasonable support weakens the users' commitment to the system, increases administrative costs due to avoidable errors, and raises the risk of complaints and legal actions. Risk also increases when a bank fails to inform customers of the security precautions (such as confidential PINs) that users are expected to adopt.

- **Vendors and Outsourcing** - The level of sophistication and the rate of change in electronic capabilities may require at least some degree of outsourcing to third parties. However, this delegation does not lessen the burden on management to supervise and control all aspects of the bank's systems. Delegation through outsourcing requires reasonable due diligence efforts throughout the term of the engagement. Conditions, rights, and responsibilities should be governed by written agreements. This is particularly important because in an electronic environment, short-term engagements, new developments, and untested entities are not uncommon. Further, all outsourcing arrangements must be coordinated to ensure that security, reliability, and integrity are not compromised.

Report Treatment

Examination findings will generally be incorporated into the Risk Management section of the safety and soundness report. Unless otherwise instructed, findings should be addressed collectively as an "other matter." At a minimum, a brief summary comment describing the bank's activities should be included. Significant findings should be carried forward to the Management page and Examination Conclusions and Comments page, as per report instructions.

Impact on Bank Ratings

Findings will primarily be factored into the management component rating for safety and soundness examinations. The degree of any impact will consider a number of factors, including:

- The specific issues in relation to the volume and trends in transactions, dollars, and customers;
- The apparent risk to the bank's financial and informational assets, including customer data, regardless of the volume and trends in activity;
- Anticipated growth in volume, whether dollars, transactions, or customers; and
- Anticipated expansion of products, services, or platforms.

Referrals to Specialists

Electronic banking activities impact other examination programs (e.g., information systems, consumer protection, and trust) in addition to safety and soundness. Therefore, contact with specialists in these areas may be necessary to comprehensively evaluate a bank's activities. Consultations with information systems specialists have been incorporated into the safety and soundness electronic banking procedures at critical junctures. Referrals to compliance and other specialists should be considered with respect to the bank's activities and the nature of examination findings.

The safety and soundness electronic banking examination procedures encompass traditional control mechanisms such as policies, procedures, and planning. However, examiners are reminded that access and speed can magnify risk in an electronic environment. This is particularly true if risk management programs are ineffective or if a system is linked to a bank's operating system and databases. In other words, a bank can be exposed to significant risk even if activity volume is nominal. Therefore, varying degrees of contact with information systems specialists will be needed when examining electronic banking activities.

In the case of a level 1 examination, information systems specialists should be contacted during the examination in the event that a system is directly connected to the bank's operating system. The level 2 procedures incorporate consultation with a specialist when the safety and soundness procedures are completed. This is to solicit input before the findings are finalized and to determine whether a technical review is warranted. The level 3 procedures require that a specialist complete a technical examination in addition to the safety and soundness program. However, in **any** situation where significant deficiencies or weaknesses are noted, a specialist should be consulted.

Examination plans should consider these needs so that consultations and technical reviews can be completed during the examination. When consultations or technical reviews are delayed due to other demands placed on specialists, examiners should contact the field office supervisor or regional office electronic banking contact for direction.

Electronic Banking Data Entry Sheet

Deployment of electronic banking activities does not require a formal application or notification to bank regulators at this time. As a result, it is likely that examiners will identify such activities either during pre-planning activities or during the course of an examination, whether safety and soundness, information systems, consumer protection, or trust. To effectively monitor bank activities and respond to trends or potential problems, examiners will complete a Data Entry Sheet that provides basic information regarding a bank's activities. More detailed instructions accompany the form. Data Entry Sheets will be completed during subsequent examinations and submitted with the report to update the information on file.

This sheet will serve as a notification for these activities to be highlighted within each of the respective examination programs. Field office supervisors should use this information to determine what, if any, follow-up activities are warranted. Such actions might include assigning specialists to the examination underway, scheduling a subsequent visitation, or directing that electronic banking activities be specifically addressed during the next regularly scheduled examination. Workpapers should be made available as a reference and to avoid duplication of effort.

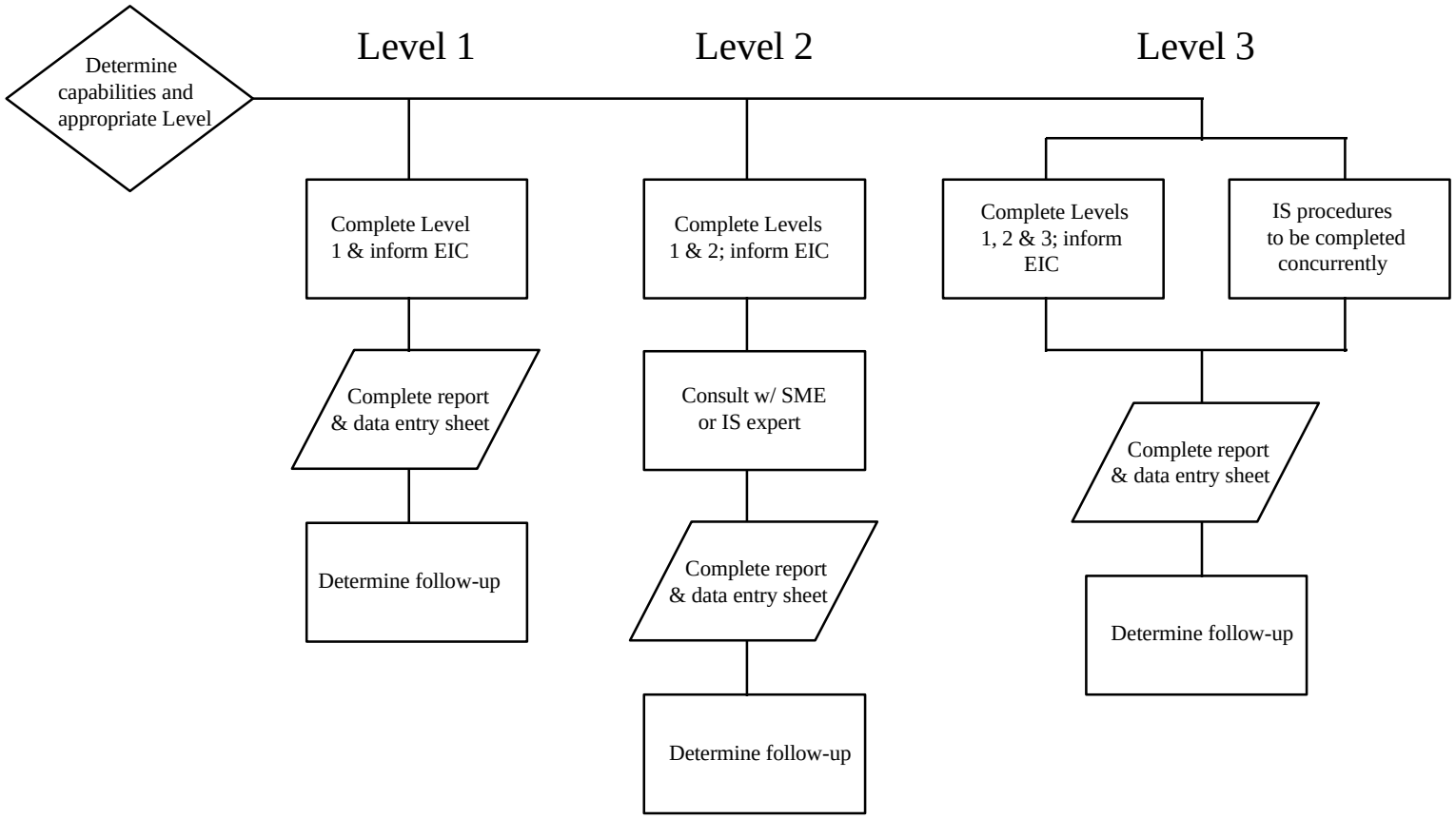
Examination Workpapers

Copies of bank documents and other information should support the examination findings and be retained for future reference. Depending on the level of review and complexity of the activity, workpapers may include:

- Summaries of strategic plans, feasibility studies, test results, and other reviews;
- Flow charts detailing the basic systems deployed in relation to the bank's databases and operating system;
- Details regarding outsourcing arrangements with third party servicers, including copies of the underlying agreements and third party audit and other reviews;
- Details of any independent reviews or certifications of Web sites;
- Information detailing activities conducted, the bank's roles, and delivery channels;
- Standard customer and user agreements;
- Details regarding complaints and lawsuits specific to electronic delivery systems;
- Internal and external audit reports and related materials;
- Summary of disaster recovery and contingency plans; and
- Summaries of relevant operating policies and procedures.

When a bank lacks relevant documentation or information, it may be indicative of management weaknesses in deploying electronic capabilities. Examiners should discuss any apparent deficiencies with bank management.

DIAGRAM OF SAFETY AND SOUNDNESS
ELECTRONIC BANKING EXAMINATION PROCEDURES



Electronic Banking

Evaluate the above-captioned function against the following control and performance standards. The Standards represent control and performance objectives to ensure the bank operates in a safe and sound manner and that the entity's objectives are carried out. Associated Risks represent potential threats to the bank if the standards are not achieved and maintained. The Standards are intended to assist examiners in analyzing important functions that may warrant additional review. All of the following Standards may **NOT** need to be considered at every bank. Conversely, these do **NOT** represent all of the control and performance standards needed for every bank. Examiners should continue to use their judgement when assessing risk.

STANDARDS	ASSOCIATED RISKS
MANAGEMENT AND CONTROL	
The board or an appropriate committee has approved each of the deployments based on a written strategic and risk analysis commensurate with the activity. (Planning and Deployment)	Systems may be deployed without clear strategic direction or without a comprehensive risk management program.
Policies and procedures have been reviewed and appropriately revised to incorporate alternative delivery and payment systems. (Operating Policies and Procedures)	Policies and procedures may not adequately address the impact on bank activities, operations, or security.
Internal and external audit programs have been updated to incorporate alternative delivery and payment systems. (Audit)	Potential weaknesses may not be identified within a specific system or within the total environment of inter-related systems.
Each system or activity has been specifically reviewed to establish the legal foundations and address regulatory issues. (Legal and Regulatory Matters)	Systems may be deployed, or activities introduced, that lack legally enforceable or defendable foundations, or may not be consistent with regulatory standards.
Appropriate standards have been established in terms of overall program administration. (Administration)	The environment of activities, systems, and operations may lack appropriate oversight and control.
Appropriate standards have been established to administer outsourcing arrangements. (Vendors and Outsourcing)	Management may inappropriately delegate control over system content, capabilities, and operations, or may become over-reliant on third party service providers.

CORE ANALYSIS

Consider the following procedures at each examination. Examiners are encouraged to continue to exercise discretion in excluding items deemed unnecessary. This procedural analysis does not represent every possible action to be taken during an examination. The references are not intended to be all-inclusive and additional guidance may exist. **Many of these procedures will address more than one of the above standards and risks.** For the examination process to be successful, examiners must maintain open communications with bank management and discuss relevant concerns as they arise.

PLANNING AND DEPLOYMENT

Level 1

Determine whether the board or an appropriate committee approved each of the deployments based on a written strategic and risk analysis commensurate with the activity. Such analysis should prompt management to ensure that strategic and operating plans were updated to incorporate electronic delivery channels and that the identified risks associated with each deployment were addressed.

Determine whether management reviewed the bank's defined trade area*. Determine whether guidelines for accepting account applications and other relevant policies and procedures have been updated to address activities beyond the traditional trade area.

Determine whether each system was reviewed by the bank's compliance officer in regards to content, required disclosures, and any other relevant issues. Verify that major findings were properly addressed.

As applicable, determine whether each system was reviewed by the bank's legal counsel. Verify that major findings were adequately addressed.

Determine whether each system was reviewed by the bank's internal or external auditors. Verify that major findings were adequately addressed.

Determine whether each system was adequately tested, including volume stress testing (to ensure system capacity) and screen testing (to review content). Determine whether a pilot program was conducted. Verify that major findings were properly addressed.

Determine whether adequate training was provided for all officers and staff affected by the deployments (including those responsible for products, services, information systems, audit, compliance, and legal). Determine whether bank management has established a program for ongoing training.

Determine whether the applicability of insurance coverage, such as blanket bond and excess coverage, errors and omission, and other coverages, has been verified. Confirm that any gaps in coverage were addressed appropriately.

* In the context of these procedures, the bank's defined trade area is viewed strategically and should not be confused with its delineated community for Community Reinvestment Act purposes.

CORE ANALYSIS

Level 2

Determine whether a feasibility study was completed or obtained for each system deployed. Determine whether the study considered "worst case" scenarios. Verify that the study was reviewed by senior management and the board. Verify that major findings were adequately addressed.

For each system that interacts with any of the bank's operating systems or databases, determine whether management required a review of the interactive components and processes to ensure compatibility and security. Verify that major issues were appropriately addressed.

Determine if management verified the accuracy and content of financial planning software, calculators, and other interactive programs (between the bank and its customers) available through the deployed systems.

Verify that a backup system or method has been established for users to conduct normal activity in the event the system is not available for an extended period of time. Verify that support materials (e.g., instruction guides) address the backup system or method. Verify that the bank has established a reasonable procedure to notify users in the event of a problem.

Level 3

There are no level 3 items for this review area.

OPERATING POLICIES AND PROCEDURES

Level 1

Review all relevant operating policies and procedures to determine if they have been updated for the unique character and principal risks associated with alternative delivery channels (including electronic advertising).

Level 2

Verify that policies and procedures governing access to, and the disclosure of, customers' confidential information have been updated for electronic capabilities. Verify that the policies also address what information may be shared with third parties (e.g., non-deposit product representatives, discount brokerage services, etc.). Confirm that guidelines pertaining to confidential information have been included as part of the contracts and agreements covering third party arrangements.

CORE ANALYSIS

Verify that the bank has established policies and procedures that control third party servicers' (e.g., electronic system providers, data processors, etc.) ability to access or monitor electronic transmissions between the bank and any of its customers. Verify that the guidelines have been included as part of the contracts and agreements covering the service arrangements.

Level 3

Determine whether customers are required to submit a signed authorization for each payee included in bill payment, funds transfer, and similar programs. Determine how the bank verifies the legitimacy of each payee, and whether the bank has adopted reasonable guidelines for adding payees.

Verify that procedures are in place to control customer transfers of uncollected funds from each access point. Confirm that safeguards are in place to detect and prevent duplicate transactions within each system deployed.

Verify that the bank's periodic reconcilement procedures have been updated to incorporate the full scope of transactional capabilities. Verify that the procedures apply to the general ledger and subsidiary accounts, as appropriate.

Determine what reporting mechanisms are employed to track the nature, volume, and trends in activity for each system deployed. Determine whether these reports include current and historical data (such as flow of funds), and provide a comparison of performance to projections.

Verify that the measurements above are incorporated into strategic and operating plans, budgets, and other analyses. Verify that the measurements are incorporated into relevant operating policies and procedures, such as funds management, liquidity, and interest rate risk.

Determine whether appropriate operating policies and procedures have been established or updated to address:

- fund transfers;
- dollar limits per transaction and relationship;
- minimum credit standards for participants, as appropriate;
- settlement guidelines; and
- daylight overdrafts.

For systems that permit access to credit lines, verify that draws or credit extensions are adequately controlled.

If applicable, determine whether appropriate policies and procedures have been established to govern foreign exchange activities.

Determine whether the bank's policies regarding separation of duties have been updated to recognize the access afforded by electronic capabilities.

CORE ANALYSIS

AUDIT

Level 1

Verify that the bank's internal and external audit programs have been updated to specifically address electronic activities and systems.

Level 2

Verify that appropriate audit trails have been incorporated into each system.

Determine whether the audit trails and procedures cover the flow of activity through compatible, integrated, or otherwise inter-related systems (i.e., from point of origin to point of destination within the set of systems).

Level 3

There are no level 3 items for this review area.

LEGAL AND REGULATORY MATTERS

Level 1

Verify that appropriate guidelines and practices have been established that comply with the requirements of Part 328 regarding advertising (i.e., posting FDIC logos, etc.).

Verify that any electronic advertisements for non-deposit investment products include appropriate disclosures.

Verify that an appropriate program has been established for periodic review of each system by the compliance officer, and if applicable, legal counsel.

Level 2

Verify that the underlying customer, vendor, and merchant agreements fully address the rights, responsibilities, and liability for each party. Determine whether the documents address the bank's authority to monitor, store, and retrieve electronic transmissions (including messages and data) between the bank and its customers.

Determine whether each system meets the minimum state and UCC standards to enforce digital signatures and related certifications, as applicable.

Determine whether outsourcing arrangements with vendors and subcontractors are included in the bank's consumer protection and legal reviews.

Level 3

Determine whether the underlying agreements covering payment systems reasonably address claims of lost or stolen value among the bank, its customers, and third parties.

Verify that appropriate procedures have been established to ensure compliance with Financial Recordkeeping and Bank Secrecy Act requirements, including Know Your Customer guidelines. Verify that procedures have been established to identify potentially structured transactions.

ADMINISTRATION

Level 1

Determine whether there is any direct connection between the bank's internal operating system(s) and the system that hosts the external electronic service or activity (for example, a Web site). If there is a direct connection, an information systems specialist should be consulted.

Determine whether there is an established program for ongoing review of each system deployed for content, continued appropriateness, accuracy and integrity, security and controls, system updates and obsolescence, system capacity, and strategic direction.

Determine whether appropriate procedures exist for maintaining links with other Web sites, including both external and internal (i.e., intranet) sites. Determine whether management regularly monitors these linked sites for continued appropriateness and accuracy of the site addresses.

Determine whether appropriate procedures have been established to monitor for unauthorized attempts to access the bank's system. Verify that the bank's policies require formal reporting consistent with Part 353 in the event of attempted or actual attacks against any of the bank's systems. Review all known incidents. If any incidents have not been reported, determine why.

Determine whether a preparedness plan has been established to respond to problem situations or if an incident response team has been designated. In the event a team has been established, verify that the board has approved a written delegation of the team's responsibilities and authority.

Level 2

Verify that senior management has established appropriate levels of access to information and applications for officers, employees, system vendors, customers, and other users. Verify that the access levels are formally established, reviewed on a regular basis, and enforced.

Determine how the bank establishes the legitimacy of each party requesting an account action or submitting related instructions or data.

CORE ANALYSIS

Determine whether policies and procedures have been adopted to address the institution's use of electronic mail. Verify that the policies and procedures:

- address transmissions among all user groups, including customers, officers, and employees; and
- define permissible content to minimize risk from improper disclosure.

Determine whether appropriate programs have been established for customer service, support, and education. Verify that:

- service and support functions are available during reasonably appropriate hours;
- appropriate educational and reference materials are made available to customers regarding system security, controls, and liability; and
- the bank has established a reasonable program to address recurring problems in a timely manner.

Determine whether retention guidelines have been established or updated for source documents supporting electronic activities, such as account applications, instructions for account transactions, and other records. Determine whether the guidelines also address electronic mail, data files, and similar records.

Verify that appropriate exception reports are generated and reviewed on a periodic basis.

Level 3

Determine whether the bank offers any guaranty or similar pledge in relation to any payment or delivery system. Verify that such guaranties have been reviewed by the bank's legal counsel, as applicable.

Determine the extent of any lawsuit or complaint filed against the bank or its vendors in connection with alternative delivery or payment systems. Determine the status of resolution and existence of any contingent liability.

Determine that, for any stored value program, the bank has determined whether the underlying funds represent insured deposits. Verify that the accounting treatment is consistent and appropriate.

VENDORS AND OUTSOURCING

Level 1

Determine whether the bank has entered into formal contracts with each vendor. Verify that the agreements:

- address access, ownership, and control of customer and other confidential information and data;
- provide reasonable assurances for continuation of service through back up arrangements in the event of a problem situation;
- address subcontractors and other supporting vendors;
- allow for reasonable control and update of content and capabilities in a timely manner;
- provide the bank with reasonable opportunities to review independent annual audits and similar reports;

- provide for reasonable security precautions on the part of the service provider; and
- have been reviewed by the bank's legal counsel, if appropriate.

Determine whether the expiration dates for inter-related service contracts coincide.

Verify that reasonable requirements have been adopted for periodic due diligence reviews of third party providers, including contractors, subcontractors, support vendors, and other parties.

Level 2

Determine whether appropriate measures have been implemented to protect against violating licensing agreements in distributing software.

Level 3

There are no level 3 items for this review area.

CORE ANALYSIS

NOTES:

CORE ANALYSIS DECISION FACTORS

Evaluate Core Analysis results in this section for significance and to determine if an Expanded Analysis is necessary. Negative responses to Core Analysis Decision Factors may **NOT** require proceeding to the Expanded Analysis. Conversely, positive responses to Core Analysis Decision Factors do not preclude examiners from proceeding to the Expanded Analysis if deemed appropriate.

1. Is an effective risk management program in effect?

2. Are adequate policies and procedures in effect and enforced?

3. Do accounting and reconcilement procedures adequately address electronic capabilities?

4. Does the audit program adequately address stand-alone, inter-related, and integrated systems?

5. Are important matters referred to the bank's legal counsel?

6. Are the bank's operations consistent with regulatory requirements?

7. Is program administration and oversight adequate?

8. Is an effective vendor oversight program in effect?

EXPANDED ANALYSIS

An expanded analysis should be performed in situations where systems are more sophisticated and/or when significant deficiencies are observed. The expanded analysis will involve technical procedures which will be performed by information systems specialists.

REPORT OF EXAMINATION PRESENTATION

Discuss findings with bank management and consult with an information systems specialist, as needed and in accordance with examination procedures, prior to completing the following:

Appropriate items should be noted on the Risk Management page and carried forward to the Management page and Examination Conclusions and Comments page, as applicable.

NOTES:

IMPACT ANALYSIS

This section helps to evaluate the impact of deficiencies identified in the Core Analyses and Decision Factors on the bank's overall condition. This section also directs the examiner to consider possible supervisory actions.

Findings will primarily be factored into the management component rating for safety and soundness examinations. The degree of any impact will consider a number of factors, including:

- The specific issues in relation to the volume and trends in transactions, dollars, and customers;
- The apparent risk to the bank's financial and informational assets, including customer data; regardless of the volume and trends in activity;
- Anticipated growth in volume, whether dollars, transactions, or customers; and
- Anticipated expansion of products, services, or platforms.

NOTES:

Electronic Banking General Information Request	cert#

Check all that apply

Activities Conducted:	Bank Roles:	Through:
___ Marketing & Informational	___ Owner or Investor	___ Advanced ATMs
___ New Account Solicitations	___ System Developer	___ Phones/Screen phones
___ Account Reconcil. & Data	___ Issuer/Originator or Agent	___ Stored Value Cards
___ Lending and Related	___ Distributor/Redeemer	___ Automated Loan Machines
___ Deposit Gathering/Related	___ Trans. Authorizer/Processor	___ PC Banking (Dial-up)
___ Non-Deposit Activities	___ Recordkeeper/Archiver	___ Intranet
___ Bill Processing and Related	___ Trusted Third Party	___ Internet Service Provider
___ Electronic Mail	___ Other: _____	___ In-house Web Server
___ Up/Download Files/Software	___ _____	___ EDI Networks
___ Funds Transfer/Cash Mgmt.	___ _____	___ Other: _____
___ Internet Service Provider	___ _____	___ _____
___ Other: _____	___ _____	___ _____
___ _____	___ _____	___ _____
___ _____	___ _____	___ _____

Bank's World Wide Web site address:_____

The following should be available for examiner review (as applicable):

_____ Feasibility studies, test plans and results, deployment plans and reviews
_____ Diagram of the systems deployed and their relationship to the bank's operating systems
_____ Vendor agreements, due diligence reports, third party reviews, audit reports and management responses, and annual reports
_____ Third party certifications of deployed systems
_____ Operating policies
_____ Disaster recovery and contingency plans
_____ Strategic plan
_____ Legal opinions and reviews
_____ User guides and agreements
_____ Compliance reviews
_____ Bank audit reports (internal and external)

_____

Does the bank have plans for expanding or discontinuing any activities, programs, or capabilities in the near future? If so, please provide details.

ELECTRONIC BANKING DATA ENTRY SHEET

General Information

An increasing number of financial institutions are developing and implementing electronic banking capabilities. Whether a bank adopts a basic informational system or a complex transactional capability, these new technologies can present a significant regulatory challenge. As such, it is important that a database of information be developed for FDIC supervised institutions engaging in electronic activities.

Onsite examinations provide the means by which basic data can be collected; the accompanying Data Entry Sheet provides the format. The sheet will be completed during each examination in which electronic activities are identified, whether safety and soundness, information systems, consumer protection, or trust. During subsequent examinations, the sheet will be completed to update the information on file. The sheet may also be completed when electronic banking activities are observed in the course of a visitation or offsite review.

Two primary objectives will be supported by this effort: (1) The data will provide a means by which electronic banking activities can be monitored at the field, regional, and Washington levels; and (2) The Data Entry Sheet will provide a means by which information can be shared between the field and regional levels, DOS and DCA included. This information should be used to determine what, if any, follow-up activity is required.

Instructions for Completion

The top section of the sheet should be completed using information from the current examination. If the sheet is completed during a visitation or offsite review, information from the most recent examination should be used. If certain information is not readily available, "NA" should be noted. If examination procedures (DOS or DCA) were conducted for electronic banking activities, check "Yes." Note the level of procedures conducted (1, 2, or 3 for DOS; 1 or 2 for DCA). If activities were observed in the course of a visit or off-site review, etc., and procedures were not completed, "No" should be checked with a brief comment describing the nature of the referral. For the purposes of this sheet, "System Administration" refers to the electronic banking system only.

The middle section is designed to identify the electronic banking activities conducted by the institution. Multiple activities, roles, and channels may be observed and should be noted accordingly. Use lines designated as "Other" to indicate any unlisted items.

The final section should be used to summarize any deficiencies or weaknesses noted during the respective examination program. Examiner judgement will be required to categorize findings as "serious," "minor," or "adequate."

The sheet should be submitted to the Regional Office with the examination report. Copies of the sheet should be distributed to the following (both DOS and DCA): Field Office files, Regional Office files, Regional Office Electronic Banking Contact, and Washington Office Electronic Banking Project.

Electronic Banking Data Entry Sheet

Bank Name	Location	Cert. No.
Holding Company	Location	Referral to:
Region	Field Office	Safety & Soundness ___ Trust ___ Information Systems ___ Compliance ___

Examination Data: **Total Assets:** _____
Type: **S&S Tier** ____ **IS** ____ **Trust** ____ **Compliance** ____

Other: _____
Date: _____ **EIC:** _____
Electronic Banking Procedures Completed: **Yes:** ___ **DOS Level :** ___
No: ___ **DCA Level :** ___
(Comment)
_____

Bank's Web Site Address: _____

System Administration: **In-house** ___ **Outsourced** ___ **Combination** ___

Primary Bank Contact: _____

Most Recent Examination Ratings:

Safety and Soundness: _____
Information Systems: _____
Trust: _____
Reg. Transfer Agent: _____
Compliance/CRA: _____
Holding Company: _____
Service Corporation: _____
Other: _____

Electronic Banking Activities

Activities Conducted:

- ___ Marketing & Informational
- ___ New Account Solicitations
- ___ Account Reconcil. & Data
- ___ Lending and Related
- ___ Deposit Gathering/Related
- ___ Non-Deposit Activities
- ___ Bill Processing and Related
- ___ Electronic Mail
- ___ Up/Download Files/Software
- ___ Funds Transfer/Cash Mgmt.
- ___ Internet Service Provider
- ___ Other: _____
- ___ _____
- ___ _____

Bank Roles:

- ___ Owner or Investor
- ___ System Developer
- ___ Issuer/Originator or Agent
- ___ Distributor/Redeemer
- ___ Trans. Authorizer/Processor
- ___ Recordkeeper/Archiving
- ___ Trusted Third Party
- ___ Other: _____
- ___ _____
- ___ _____
- ___ _____
- ___ _____
- ___ _____
- ___ _____

Through:

- ___ Advanced ATMs
- ___ Phones/Screen phones
- ___ Stored Value Cards
- ___ Automated Loan Machines
- ___ PC Banking (Dial-up)
- ___ Intranet
- ___ Internet Service Provider
- ___ In-house Web Server
- ___ EDI Networks
- ___ Other: _____
- ___ _____
- ___ _____
- ___ _____
- ___ _____

Comments:

Examination Findings (Serious Deficiencies, Minor Deficiencies, or Adequate)

Safety and Soundness: _____ **Trust:** _____
Information Systems: _____ **Consumer Protection:** _____

Comments/Follow-up:

Distribution: Applicable DOS and DCA Field Offices, DOS and DCA Regional Office Electronic Banking Contacts, Washington Office DOS and DCA Electronic Banking Projects

ELECTRONIC BANKING GLOSSARY

Access Products - products that allow consumers to access traditional payment instruments electronically, generally from remote locations.

Acquirer - in an electronic money system, the entity or entities (typically banks) that hold deposit accounts for merchants and to which transaction data are transmitted.

Alpha Test - the first stage of testing a new software product, carried out by the manufacturer's staff.

Alternative Payment Systems - payment systems such as those based on stored value cards, electronic currency, and debit or credit cards. These are alternative avenues to deliver traditional banking and related products and services.

American National Standards Institute (ANSI) - a standard-setting organization; it is the U.S. representative to the International Standards Organization (ISO).

American Standard Code for Information Interchange (ASCII) - a standard code for representing characters as numbers that is used on most microcomputers, computer terminals, and printers.

Applet - a small application program that is designed to do a small, specific job.

Application - a computer program or set of programs that perform the processing of records for a specific function.

Asynchronous Transfer Mode (ATM) - method of transmitting bits of data one after another with a start bit and a stop bit to mark the beginning and end of each data unit.

Auditability - the degree to which transactions can be traced and audited through a system.

Authentication - the process of proving the claimed identity of an individual user, machine, software component or any other entity.

Authoring Software - software used to produce multimedia or hypertext presentations by linking sounds, music, visuals, and text.

Authorization - the process of determining what types of activities are permitted. Usually, authorization is in the context of authentication: once you have authenticated a user, they may be authorized different types of access or activity.

Bandwidth - the transmission capacity of a computer channel or communications line.

Bastion Host - a system that has been hardened to resist attack, and which is installed on a network in such a way that it is expected to potentially come under attack. Bastion hosts are often components of firewalls, or may be "outside" Web servers or public access systems.

Baud Rate - measurement of data transfer speed.

Beta Test - the second stage of a new software product that is almost ready for market, carried out by volunteers in a wide variety of settings like those in which the finished product will be used.

Biometrics - a method of verifying an individual's identity by analyzing a unique physical attribute.

Bridge - in local area networks, a device that enables two networks, even ones dissimilar in topology, wiring, or communications protocols, to exchange data.

Browser - a computer program that enables the user to retrieve information that has been made publicly available on the Internet; also permits multimedia (graphics) applications on the World Wide Web.

Bundled Software - software that is sold in combination with hardware.

Chip - an electronic device consisting of circuit elements on a single silicon chip. The most complex circuits are microprocessors, which are single chips that contain the complete arithmetic and logic units of computers.

Chip Card - also known as an integrated circuit (IC) card. A card containing one or more computer chips or integrated circuits for identification, data storage or special-purpose processing used to validate personal identification numbers, authorize purchases, verify account balances and store personal records.

Clearing - the process of transmitting, reconciling and, in some cases, confirming payment orders prior to settlement, possibly including netting of instructions and the establishment of final positions for settlement.

Clearing House - a central location or central processing mechanism through which financial institutions agree to exchange payment instructions. The institutions settle for items exchanged at a designated time based on the rules and procedures of the clearing house.

Clearing System - a set of procedures whereby financial institutions present and exchange data and/or documents relating to funds or securities transfers to other financial institutions.

Client-Server Network - a method of allocating resources in a local area network so that computing power is distributed among computer workstations in the network but some shared resources are centralized in a file server.

Closed Network - a telecommunications network that is used for a specific purpose, such as a payment system, and to which access is restricted (also referred to as a private network).

Closed Stored Value System - a system in which value is issued and accepted by either a relatively small group of merchants, or in which the system is limited geographically (i.e., university programs and fare cards for mass transit systems).

Code - computer programs, written in machine language (object code) or programming language (source code).

Computer Emergency Response Team (CERT) - located at Carnegie-Mellon University, this incident response team offers advisories which contain enormous amounts of useful, specific security information.

Cracker - a computer operator who breaks through a system's security. This can be legitimate activity, such as to test system security measures.

Cryptography - the principles, means, and methods for rendering information unintelligible and for restoring encrypted information to intelligible form (i.e., scrambling a message).

Cyber Mall - a set of electronic or digital storefronts linked through a common Web site.

Cyberspace - a popularized term that refers to the part of society and culture that exists in networked computer systems rather than in any particular physical location.

Database Administrator (DBA) - the individual with authority to control the data base management system.

Data Encryption Standard (DES) - U.S. government standard for data encryption method published by the National Institute of Standards and Technology for the encryption of sensitive U.S. government data which does not fall under the category of national security related information. The DES uses a 64 bit key.

Data Integrity - the property that data meet with a priority expectation of quality.

Dedicated - assigned to only one function.

Design Phase - the phase during which the problem solution that was selected in the Study Phase is designed. The design includes the allocation of system functions; the design of inputs, outputs, and files; and the identification of system and component requirements.

Design Specification - a baseline specification that defines how to construct a computer-based business system.

Development Phase - the phase in which the computer-based system is constructed from the "blueprint" prepared in the Design Phase. Equipment is acquired and installed. All necessary procedures, manuals, and other documentation are completed. Personnel are trained, and the complete system is tested for operational readiness.

Dial-up - the ability of a remote user to access a system by using private or common carrier telephone lines.

Digital - referring to communications processors, techniques, and equipment where information is encoded as a binary "1"or "0".

Digital Certification - a process to authenticate (or certify) a party's digital signature; carried out by trusted third parties.

Digital Signatures - a mathematical encryption technique that associates a specific person with a given computer file and indicates that the file has not been altered since that person signed it; should not be confused with making an electronic representation of a written signature.

Distributed Transaction Processing - application processing that involves multiple users requiring concurrent access to a single shared resource.

Domain Name - an alpha-numeric name for a Web site that includes both the online address and online name.

Double Spending (Re-spending) - creating and spending copies of stored value files.

Download - to transmit a file or program from a central computer to a smaller computer or a remote site.

Electronic Benefits Transfer (EBT) - the electronic delivery of government benefits, using plastic cards and available ATM and point-of-sale (POS) technology.

Electronic Cash - the digital equivalent of dollars and cents (also referred to as digital cash).

Electronic Data Interchange (EDI) - the transfer of information between organizations in machine readable form.

Electronic Document - the digital or computer equivalent of paper documents.

Electronic Money - monetary value measured in currency units stored in electronic form on an electronic device in the consumer's possession. This electronic value can be purchased and held on the device until reduced through purchase or transfer.

Electronic Purse - a stored value device that can be used to make purchases from more than one vendor.

E-mail - messages people send to one another electronically from one computer to another.

Encryption (Cryptography) - the process of scrambling data by a device or encoding principle (mathematical algorithms) so that the data cannot be read without the proper codes for unscrambling the data.

End-to-end Encryption - the protection of information passed in a telecommunications system by cryptographic means, from point of origin to point of destination.

Ethernet - a type of local area network originally developed by Xerox, communication takes place by means of radio frequency signals carried over coaxial cable.

Feasibility Analysis - the process of determining the likelihood that a proposal will fulfill specified objectives.

File Transfer Protocol (FTP) - a standard way of transferring files from one computer to another on the Internet.

Firewall - a system or combination of hardware and software solutions that enforces a boundary between two or more networks.

Flowchart - a programming tool to graphically present a procedure by using symbols to designate the logic of how a problem is solved.

Gamma Test - the third stage of software testing completed before release.

Gateway - a computer that performs protocol conversion between different types of networks or applications.

Gopher - a computer program, and an accompanying data transfer protocol, for reading information that has been made available to users on the Internet.

Graphical User Interface (GUI) - a way of communicating with a computer by manipulating icons (pictures) and windows with a mouse.

Groupware - software that allows a group of people to work on the same data through a network, by facilitating file sharing and other forms of communication.

Hacker - a computer operator who breaks into a computer without authorization, either for malicious reasons or just to prove it can be done.

Home Banking - banking services that allow a customer to interact with a financial institution from a remote location by using a telephone, television set, terminal, personal computer, or other device to access a telecommunication system which links to the institution's computer center.

Home Page - a screen of information made available to users through the Internet or a private intranet; it is the "main page" that users are expected to read first in order to access the other pages that comprise the Web site.

Host - also known as a host computer that is the primary or controlling computer in a computer network, generally involving data communications or a local area network.

Hypertext - electronic documents that present information that can be connected together in many different ways, instead of sequentially.

Hypertext Markup Language (HTML) - a set of codes that can be inserted into text files to indicate special typefaces, inserted images, and links to other hypertext documents.

Hypertext Transfer Protocol (HTTP) - a standard method of publishing information as hypertext in HTML format on the Internet.

Icon - a small picture on a computer screen that represents a particular object, operation, or group of files.

Incident Response Team - a team of computer experts (internal or external) organized to protect an organization's data, systems, and other assets from attack by hackers, viruses, or other compromise.

Integrated Circuit Card (IC Card) - a plastic card in which one or more integrated circuits are embedded (also called a chip card).

Integrated Services Digital Network (ISDN) - a type of all-digital telephone service. ISDN lines provide a connection that can transmit digital data as well as voice, without a modem.

International Organization for Standardization/Open Systems Interconnection (ISO/OSI) - an international standard-setting organization. ANSI is the U.S. representative.

Internet - a worldwide network of computer networks (commonly referred to as the Information Superhighway).

Internet Service Provider (ISP) - an entity that provides access to the Internet and related services, generally for a fee.

Interoperability - the compatibility of distinct applications, networks, or systems.

Intranet - a private network that uses the infrastructure and standards of the Internet and World Wide Web, but is cordoned off from the public Internet through firewall barriers.

Issuer - in a stored value or similar prepaid electronic money system, the entity which receives payment in exchange for value distributed in the system and which is obligated to pay or redeem transactions or balances presented to it.

Key - A secret value or code used in an encrypting algorithm known by one or both of the communicating parties.

Large-dollar Funds Transfer System - a funds transfer system through which large-dollar and high-priority funds transfers are made between participants in the system for their own account or on behalf of their customers. Sometimes known as wholesale funds transfer systems.

Limited Purpose Prepaid Card - a prepaid card which can be used for a limited number of well-defined purposes. Its use is often restricted to a number of identified points of sale within a specified location. In the case of single-purpose prepaid cards, the card issuer and the service provider may be identical.

Local Area Network (LAN) - a network that connects several computers that are located nearby (in the same room or building), allowing them to share files and devices such as printers.

Lock and Key Protection System - a protection system that involves matching a key or password with a specific access requirement.

Logging - the storing of information about events that occurred on the firewall or network.

Magnetic Stripe - used on debit, credit, and identification cards to store encoded information read by card readers; less secure than computer chip cards.

Memory Card - an integrated circuit (IC) card capable of storing information only.

Middleware - facilitates the client/server connections over a network and allows client applications to access and update remote databases and mainframe files.

Multimedia - the combining of different elements of media (i.e., text, graphics, audio, video) for display and control from a personal computer.

Multipurpose Prepaid Card - a prepaid card which can be used for a wide range of purposes and has the potential to be used on a national or international scale but may sometimes be restricted to a certain area.

National Institute for Standards and Technology (NIST) - established within the Department of Commerce to develop technical, management, physical and administrative standards and guidelines for the cost effective security and privacy of sensitive information in Federal computer systems. NIST issues the Federal Information Processing Standards (FIPS).

National Security Agency (NSA) - responsible for government and/or military information security.

National Telecommunications Information Administration (NTIA) - a government agency charged with safeguarding personal information on U.S. citizens.

Navigation - moving through a complex system of menus or help files.

Network - a group of computers connected by cables or other means and using software that enables them to share equipment and exchange information. A system of software and hardware connected in a manner to support data transmission.

Newsgroup - public forums or discussion areas on a computer network; generally topic-focused.

Node - any device, including servers and workstations, connected to a network. Also, the point where devices are connected.

Non-repudiable Transactions - transactions that cannot be denied after the fact.

Offline - equipment or devices that are not in direct communication with the central processor of a computer system, or connected only intermittently.

Online - equipment or devices that communicate with a computer network. Connections can be direct (as in a LAN using dedicated connections) or indirect (as in using the Internet).

Online Scrip - debit accounts on the Internet or other major computer network.

Online Service Providers (OSP) - closed network services that provide access to various computer sites or networks for a fee.

Open Network - a telecommunications network to which access is not restricted.

Open Stored Value System - a system that may be comprised of one or more electronic cash issuers of stored value that is accepted by multiple merchants or entities.

Operating System - a program that controls a computer and makes it possible for users to enter and run their own programs.

Operation Phase - the phase in which changeover from an old system to a new system occurs. The system is then operated and maintained. System performance is audited, and change to the system is managed.

Packet Switching - a data transmission method that routes packets along the most efficient path and allows a communication channel to be shared by multiple connections.

Password - a unique word or string of characters that a programmer, computer operator, or user must supply to satisfy security requirements before gaining access to the system or data.

Password Cracker - a software program designed to conduct an automated brute force attack on the password security controls of an information system by "guessing" user passwords.

Password Sniffer - a software program that is illicitly inserted somewhere on a network to capture user passwords as they pass through the system.

Payment System - a financial system that establishes the means for transferring money between suppliers and users of funds, usually by exchanging debits or credits between financial institutions.

Performance Specification - a baseline specification that describes what a computer-based business system is to do. It is completed at the conclusion of the Study Phase.

Personal Identification Number (PIN) - a sequence of digits used to verify the identity of a device holder.

Piggyback (Between-the-lines Entry) - a means of gaining unauthorized access to a system via another user's legitimate connection.

Point of Sale (POS) - a system of terminals that debits or charges a customer's account and credits or pays a merchant's account to effect payment for purchases at retail establishments.

Prepaid Card - a card on which value is stored, and for which the holder has paid the issuer in advance.

Privacy - in the context of a payment system, the property that no information which might permit determination of transactions may be collected without the consent of the counterparties involved.

Privacy Enhanced Mail (PEM) - an Internet standard for secure electronic mail. The standard adds several security services to the Internet electronic mail messages: message origin authentication; message integrity; nonrepudiation of origin; and message confidentiality.

Protocols - a standardized set of rules that define how computers communicate with each other.

Proximity Cards - cards that can be read from a short distance; mainly used for security and vehicle identification.

Public Key Cryptography - type of cryptography in which the encryption process is publicly available and unprotected, but in which a part of the decryption key is protected so that only a party with knowledge of both parts of the decryption process can decrypt the cipher text.

Public Law 100-235 - Computer Security Act of 1987; assigned the National Institute of Standards and Technology with the responsibility for developing standards and guidelines for federal computer systems processing unclassified data.

Real Time Monitoring - the monitoring of activity as it occurs rather than storing the data for later review.

Remote Payment - a payment carried out through the sending of payment orders or payment instruments.

Repudiation - the denial by one of the parties to a transaction of participation in all or part of that transaction or of the content of the communication.

Router - a computer system in a network that stores and forwards data packets between local area networks and wide area networks.

Scattering - the process of mixing the integrated circuit (IC) chip components so that they cannot be analyzed easily.

Search Engines - software programs that are capable of locating specified information or Web sites on the Internet.

Searchware - software used to search through a database.

Secure Electronic Transaction (SET) - a set of standards jointly developed by Visa, MasterCard, and several technologies companies to facilitate secure credit card transactions over the Internet.

Secure Hypertext Transfer Protocol (SHTTP) - provides secure communication mechanisms between an HTTP client-server pair.

Secure Socket Layer (SSL) - a protocol for providing data security during transmission using data encryption, server authentication, and message integrity.

Server - a computer that provides services to another computer (the client).

Settlement - an act that discharges obligations with respect to funds or securities transfers between two or more parties.

Settlement system - a system used to facilitate the settlement of transfers of funds.

Simple Mail Transfer Protocol (SMTP) - a protocol used to transfer electronic mail between computers on the Internet.

Smart Card - a card with a computer chip embedded, on which financial, health, educational, and security information can be stored and processed.

Specification - documents that contain basic detailed data.

Spoofing - an attempt to gain access to a system by posing as an authorized user.

Standards - the rules under which analysts, programmers, operators, and other personnel in an information service organization work.

Stored Value Card - a card that stores prepaid value via magnetic stripe or computer chip.

Structured Query Language (SQL) - a query language used to manipulate large databases.

Structured Walk-through - a technical review performed to assist the technical people working on a project. It is one of a series of reviews that should be a planned part of system design and development activities.

Study Phase - the phase during which a problem is identified, possible solutions are studied, and recommendations are made with regard to committing the resources required to design a system.

System Flowchart - a flowchart diagraming the flow of work, documents, and operations in a data processing application.

System Integrity - the quality that a system has when it performs its intended function in an unimpaired manner, free from deliberate or inadvertent manipulation of the system.

System Specification - a baseline specification containing all the essential computer-based business system documentation. It is completed at the end of the Development Phase.

Systemic Risk - the risk that the failure of one participant in a funds transfer system, or in financial markets generally, to meet its required obligations will cause other participants or financial institutions to be unable to meet their obligations when due.

Systems Analysis - the performance, management, and documentation of the four phases of the life cycle of a business system: study, design, development, and operation.

Tamper-evident - the capacity of devices to show evidence of physical attack.

Tamper-proof - the proven capacity of devices to resist all attacks.

Tamper resistant - the capacity of devices to resist physical attack up to a certain point.

Telecommunications - data transmission between a computing system and remotely located devices via telephone lines, cable, or wireless technology.

Telnet - a protocol that permits users to access a remote terminal or another computer through a network; widely used on the Internet.

Threat Monitoring - the analysis, assessment, and review of audit trails and other data collected for the purpose of searching out system events that may constitute violations or attempted violations of system security.

Throughput - the total amount of useful work performed by a data processing system during a given period of time.

Topology - the arrangement of nodes usually forming a star, ring, tree, or bus pattern.

Traceability - the degree to which transactions can be traced to the originator or recipient (also referred to as auditability).

Transferability - in electronic money systems, the degree to which an electronic balance can be transferred between devices without interaction with a central authority.

Transport Control Protocol/Internet Protocol (TCP/IP) - a standard format for transmitting data in packets from one computer to another, on the Internet and within other networks. TCP deals with the construction of the data packets while IP routes them from machine to machine.

Trap Door - a concealed and unauthorized entrance into a computer operating system, designed by the programmer.

Trojan Horse - a program that appears to perform a useful function and sometimes does so quite well but also includes an unadvertised feature, which is usually malicious in nature.

Truncation - dropping off part of a character string either to conserve space or because of limited space.

Trusted Computer System - a system that employs sufficient assurance measures to allow its use for simultaneous processing of a range of sensitive or classified information.

Trusted Third Party - a reputable entity that authenticates one or more parties to an electronic transaction. The authentication process generally involves the issuance and administration of digital certificates.

Uniform Resource Locator or Universal Resource Locator (URL) - a way of specifying the location of available information on the Internet.

Upload - to transmit a file to a central computer from a smaller computer or a remote location.

Usenet - a set of many newsgroups distributed via the Internet.

Virtual Corporations - corporations that have no official physical site presence and are made up of diverse geographically dispersed or mobile employees.

Virus - a program with the ability to reproduce by modifying other programs to include a copy of itself. It may contain destructive code that can move into multiple programs, data files, or devices on a system and spread through multiple systems in a network.

Vulnerability - a weakness in system security procedures, system design, implementation, internal controls, etc., that could be exploited to violate system security.

Web Page - a screen of information supporting the home page of a Web site.

Web Site - the collection of an entity's home page and other proprietary pages located on the World Wide Web.

Wide Area Network (WAN) - a communications network that covers a wide geographic area, such as state or country, using high speed long distance lines or satellites provided by a common carrier.

World Wide Web (Web, WWW) - a subnetwork of the Internet through which information is exchanged via text, graphics, audio, and video.

Worm - a program that scans a system or an entire network for available, unused space in which to run. Worms tend to tie up all computing resources in a system or on a network and effectively shut it down.